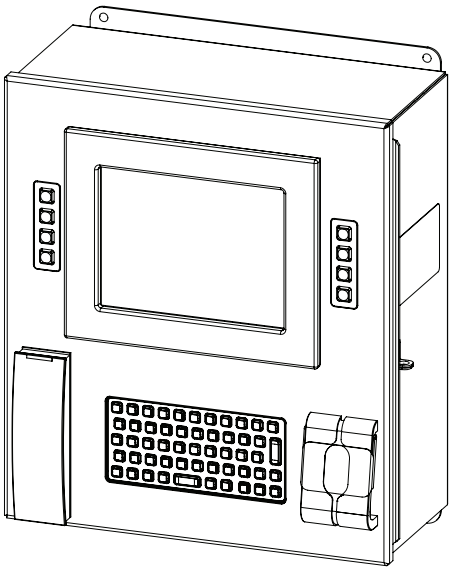
Installation and Operations Manual

8620 Data Entry Terminal

Field interface used for data entry and process management at facility control points



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Caution! Damage to equipment may result if this precaution is disregarded.

Warning! Direct injury to personnel or damage to equipment which can cause injury to personnel may result if this precaution is not followed.

Safety Precautions

Read this manual carefully and make sure you understand its contents before using this product. Follow all instructions and safety guidelines presented in this manual when using this product. If the user does not follow these instructions properly, Varec cannot guarantee the safety of the system.

Note Comply with all applicable regulations, codes, and standards. For safety precautions, the user should refer to the appropriate industry or military standards.

Caution! Electrical Hazard! Read and understand static and lightning electrical protection and grounding described in API 2003. Make certain that the 8620 Driver Entry Terminal (DET) installation, operation, and maintenance conforms with the practice set forth therein. Make sure the power is turned off at the main circuit breaker or switch. The power switch should be in the OFF position, locked, and labeled to prevent other personnel from turning the power on during installation.

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1 Introduction

This manual provides the information needed to install, maintain, and troubleshoot the Varec 8620 Driver Entry Terminal (DET).

1.1 Overview

The 8620 DET is a field interface device designed for data entry and process management at facility control points, such as entry and exit gates, load racks, BOL request stations, weight scale stations, and preload stations. It features multiple interface components, such as a display, card reader, and fingerprint scanner that can be used to enter and record pertinent information about the operator or operation.

The 8620 DET interfaces to FuelsManager® Oil and Gas Terminal Automation Edition software. It captures data based on the desired configuration for the specific control point application, process, or operation. For example, it may capture driver ID for access control, truck ID for equipment safety, and loading or company ID for product allocations. Refer to the *FuelsManager Software User Guide(s)* and documentation for your specific implementation.

The 8620 DET is constructed with the following assemblies as shown in Figure 1-1:

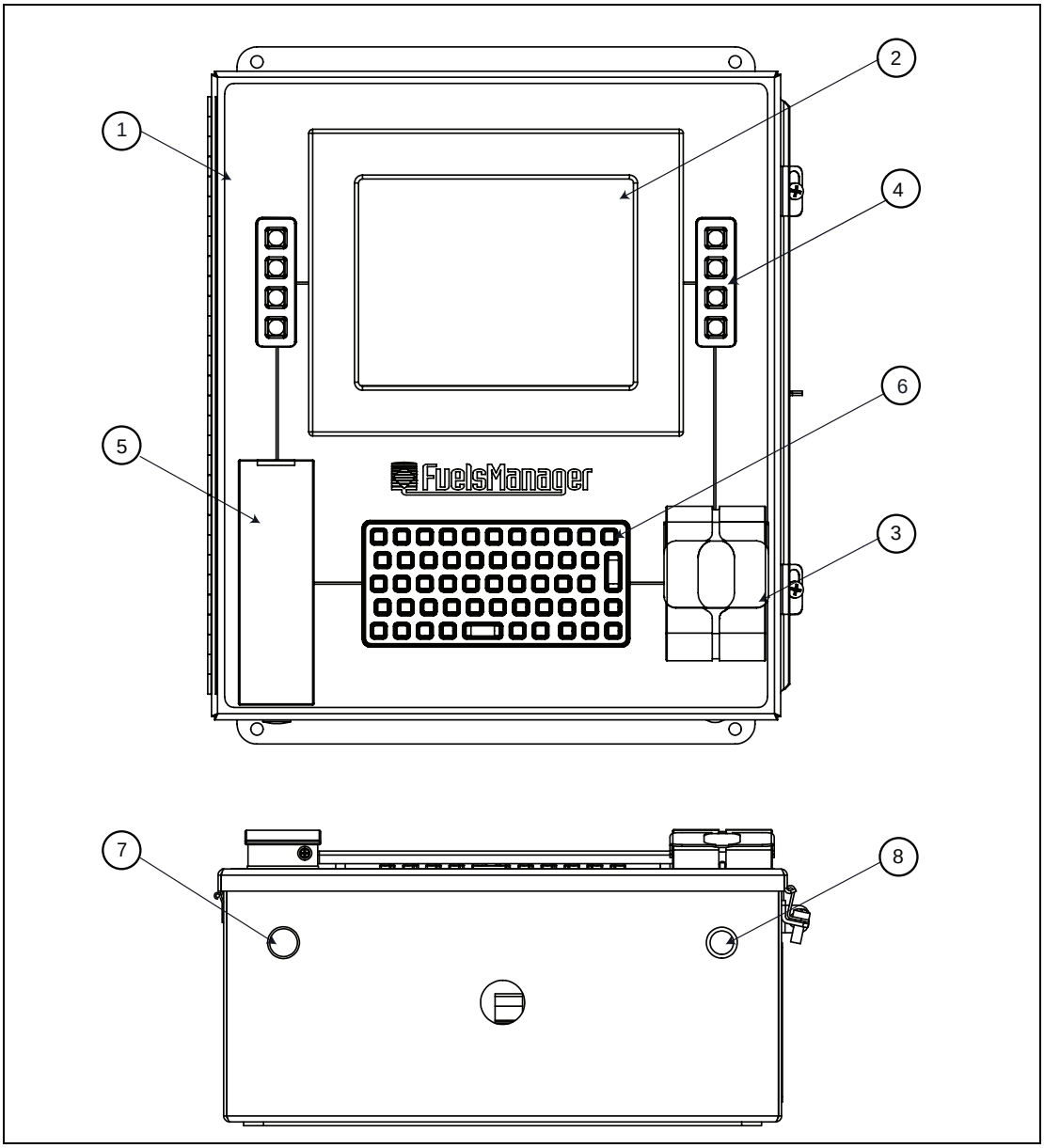

Figure 1-1: 8620 DET System Components

Item	Qty	Description
1	1	17.50" x 14.92" Enclosure with Window Kit
2	1	8.4" LCD
3	1	Fingerprint Scanner
4	2	4-Key Keypad
5	1	Smart Card Reader
6	1	Keyboard
7	1	LED Indicator
8	1	Reset Button

Table 1-1: 8620 DET System Components

1.2 Functionality and System Design

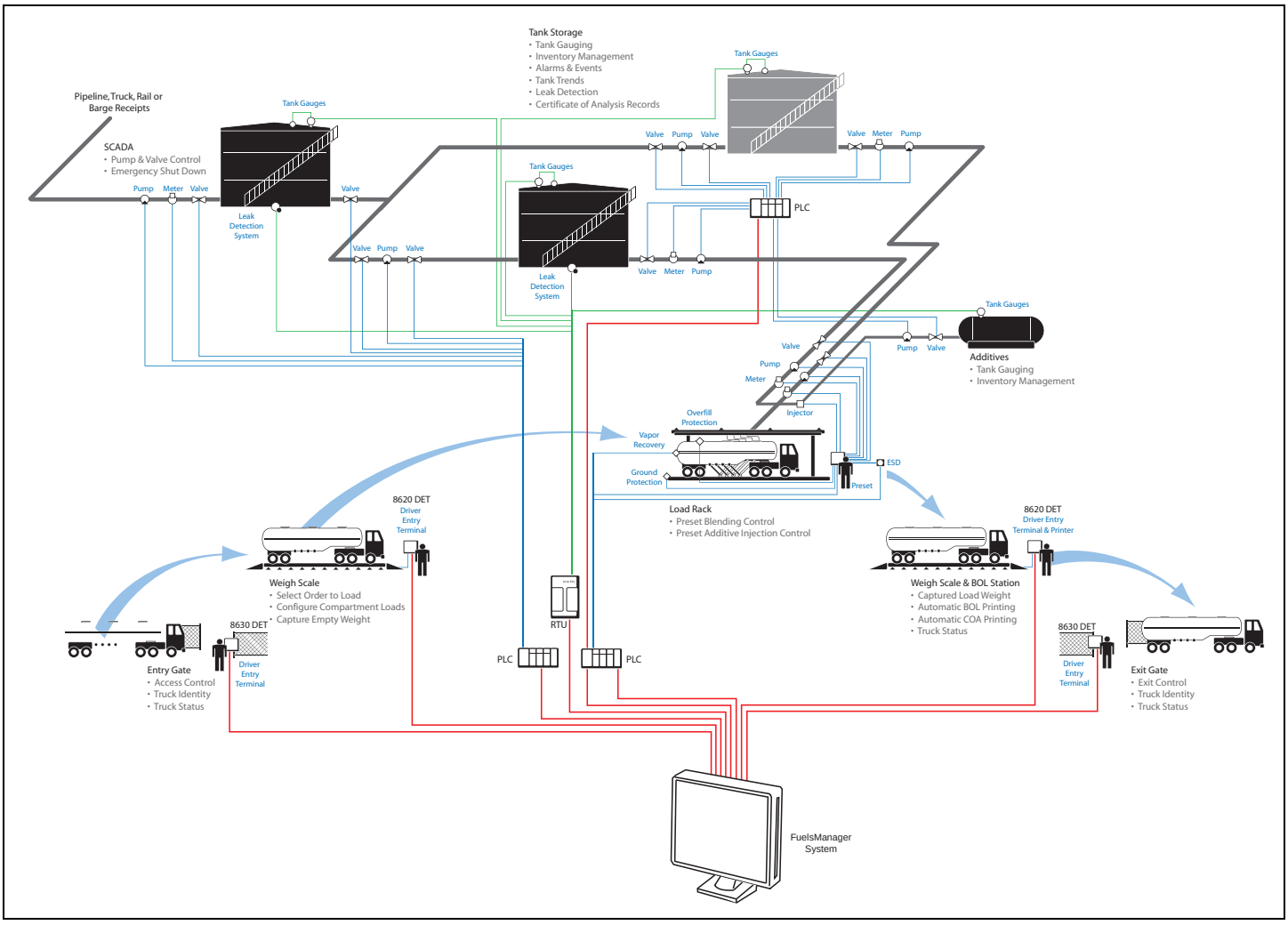

Figure 1-2: 8620 DET System Diagram

2 Preparing for Installation

This chapter provides a site preparation checklist, safety information, unpacking instructions, and installation instructions.

2.1 Site Preparation Checklist

Before installing the 8620 DET, ensure the following items:

- The use of a protective canopy or sunshade is recommended in order to shield the driver entry terminal from direct sun, rain, and snow
- Adequate space for installation
- The appropriate communication lines back to the FuelsManager Oil & Gas Terminal Automation system
- Power (AC or DC)
- Grounding
- Enclosure protection, such as concrete barrier poles to prevent trucks from damaging the unit

2.2 General Safety Guidelines

The user shall follow safety guidelines provided by the Occupational Safety and Health Administration (OSHA) for additional protection. Information may also be obtained from the following sources:

- National Electrical Code (NEC)
- National Fire Protection Association (NFPA)
- Instrument Society of America (ISA)
- FM Approvals (FM)
- Underwriters Laboratories Incorporated (UL)

When in doubt about the safety of an area, check with the local safety authorities. Always observe equipment labels and warning signs posted in the area.

2.3 Installation Safety Guidelines

This equipment should be installed only by qualified personnel familiar with the installation of display and monitoring equipment.

Caution should be exercised when any area that is posted or otherwise assumed to contain hazardous gases. Always follow OSHA guidelines.

To prevent shock hazards, the housing of all units should be properly grounded in accordance with the National Electrical Code. A grounding conductor should be wired to the grounding terminal provided on the 8620 DET.

! Warning Before attempting installation of the 8620 DET, review the “General Safety Guidelines” section above. Installation and maintenance personnel should become familiar with any hazards present as well as any agency requirements before working with any equipment.

Obtain a hot work permit before performing maintenance on the 8620 DET with power applied.

Before installing/repairing any wiring to the 8620 DET, make sure that the power is turned off at the main circuit breaker or switch. The power switch should be locked in the OFF position and labeled to prevent other personnel from turning the power on during installation.

Do not apply power until the 8620 DET is properly grounded.

Do not apply power unless the environment is known to be non-hazardous.

Incorrect field wiring connections can damage the 8620 DET electronics and cause system malfunctions.

2.4 Unpacking

Varec's 8620 DET(s) are shipped fully assembled and ready for installation.

To unpack the 8620 DET, follow the steps below:

1. Place the shipping container on a secure bench.
2. Open the shipping container, taking care not to damage the contents.
3. Carefully remove the 8620 DET from the shipping container and place it on the bench.
4. Inspect the 8620 DET for shipping damage. Report any damage to the carrier and Varec.

Note If the 8620 DET must be stored prior to installation, it should be repacked in its shipping container and stored in a temperature-and-humidity-controlled environment.

2.5 Installation

To install the 8620 DET, follow the steps below:

1. Verify proper 8620 DET configuration for the RS-232, RS-422/485, or Ethernet protocol.
2. Ensure proper grounding of the 8620 DET.
3. Ensure proper mounting of the 8630 DET. Refer to Figure 2-1 on page 7 for dimensions and mounting holes.
4. Based on the application (trucks, cars, and pedestrians), ensure that the 8620 DET can be mounted at a suitable height.
5. Install proper mounting hardware (pole, stand, or wall).
6. Install the 8620 DET to the mounting hardware. The mounting hardware must be capable of supporting the 8620 DET. If mounted to a wall with stud framing, make sure the fasteners are securely mounted into the studs.
7. Run the conduit and wiring to the 8620 DET. To maintain the Ingress Protection rating of the 8620 DET, waterproof conduit connections must be used.
8. Power up and verify communications.

Note Quality electrical wiring is necessary for proper operation. Poor quality electrical wiring may cause a drop in the supply voltage. For DC-powered units, verify that the voltage at the DET during startup and operation is within the recommended operating voltage range of 24 to 48 VDC.

Figure 2-1 shows the dimensions of the 8620 DET.

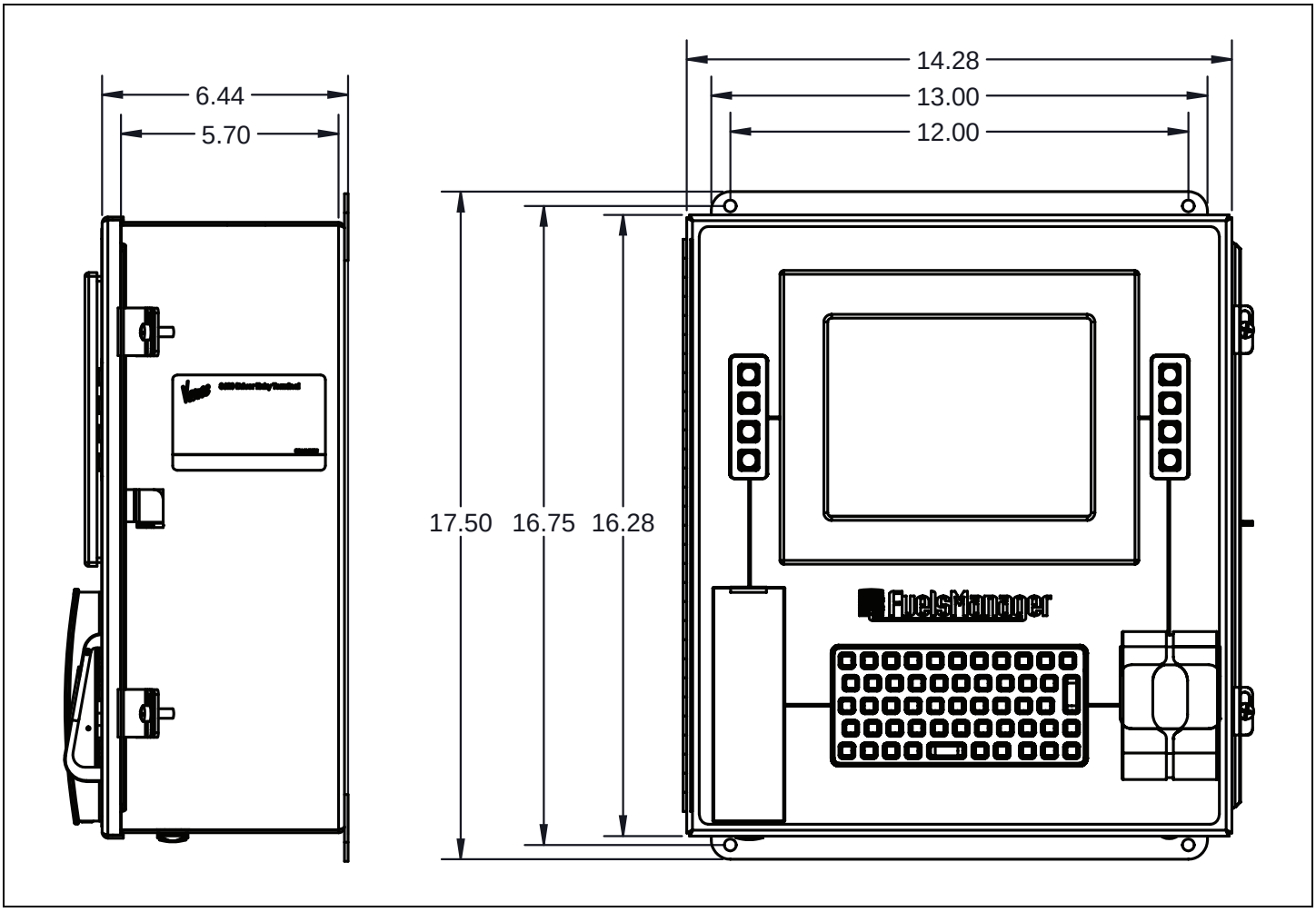

Figure 2-1: 8620 DET Dimensions

3 Wiring

This chapter describes wiring requirements for the 8620 DET. Wiring should be performed after the unit is installed.

3.1 Overview

Field wiring of the 8620 DET consists of the following:

- Power (AC/DC)
- Communications (RS-232, RS-485/422, or Ethernet)
- Digital I/O (Optional)
- Power Disconnect Device
    a. a switch or circuit-breaker shall be included in the building installation;
    b. it shall be in close proximity to the equipment and within easy reach of the operator; and
    c. it shall be marked as the disconnecting device for the equipment.

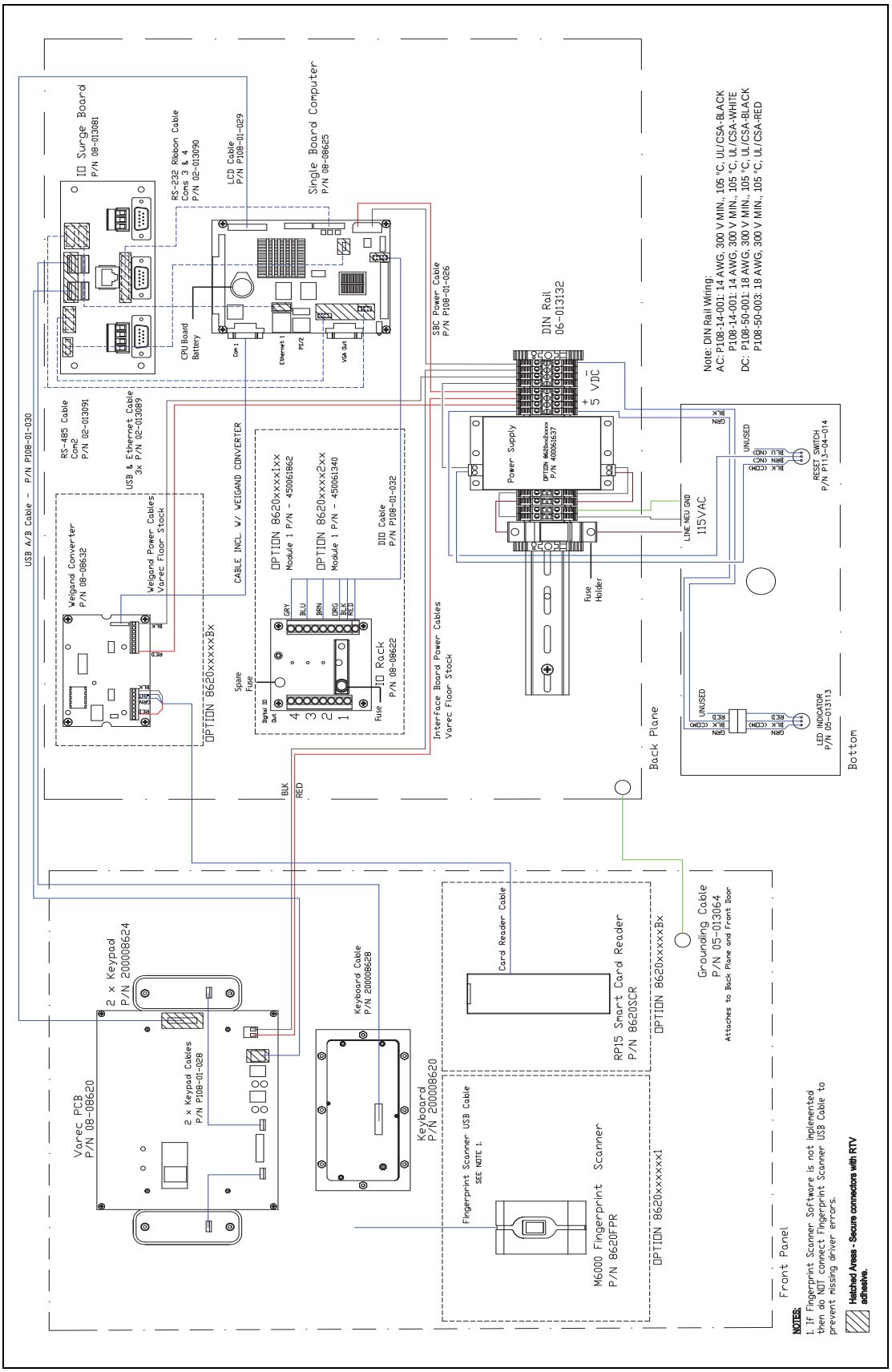

Figure 3-1: 8620 DET AC Wiring Diagram

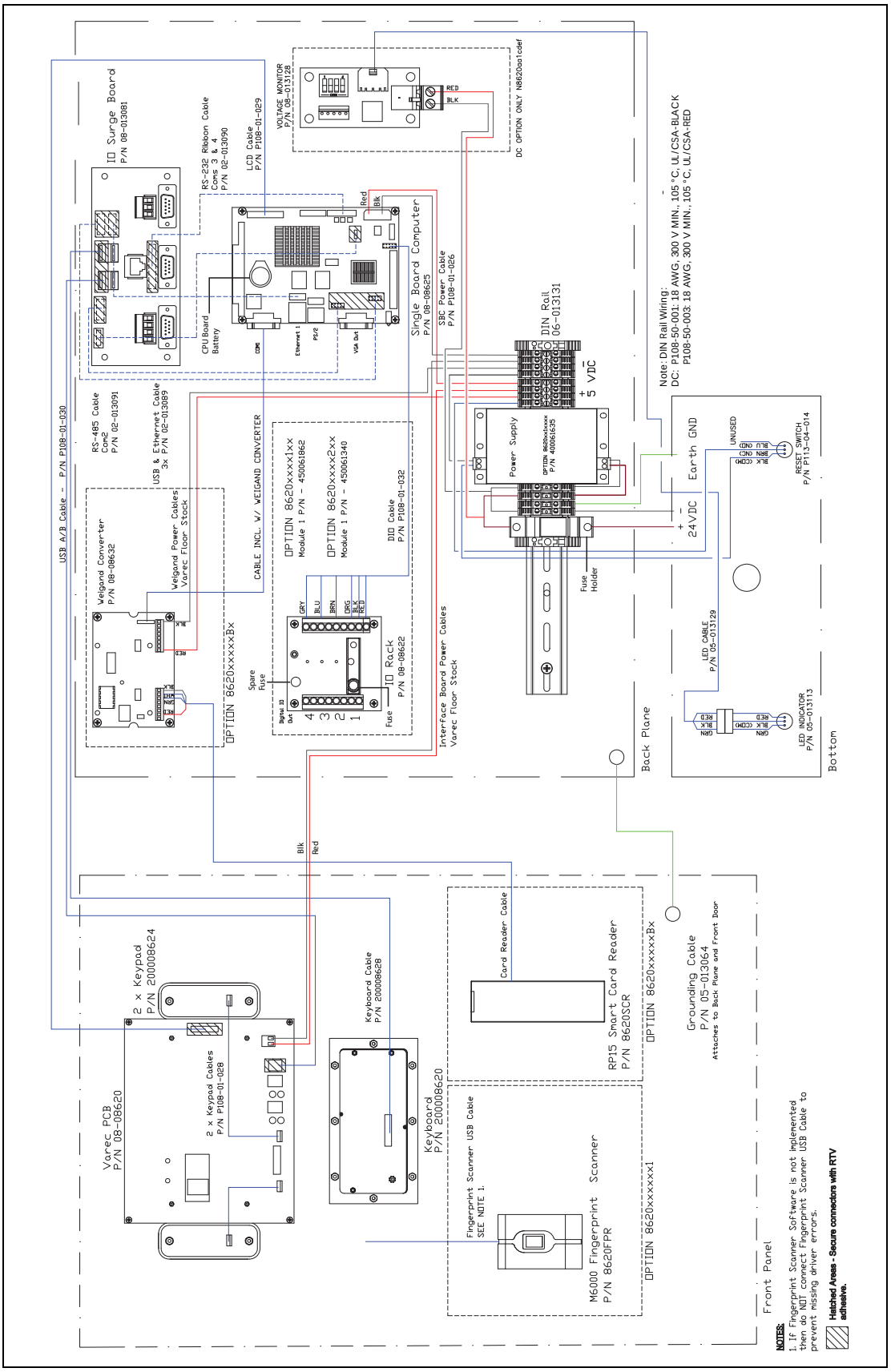

Figure 3-2: 8620 DET DC Wiring Diagram

3.1.1 Power

To connect DC or AC power to the 8620, connect the power wires to the appropriate terminals supplied with the 8620 DET.

Note Before connecting power wires to the 8620 DET, ensure that the power is switched off and that the 8620 DET is correctly grounded.

AC Wiring

To connect the AC wiring, perform the following steps:

1. Connect the hot wire to the fuse holder as shown in Figure 3-1 on page 10.
2. Connect the neutral wire to the black terminal as shown in Figure 3-1 on page 10.
3. Connect the ground wire to the green/yellow terminal.

DC Wiring

To connect the DC wiring, perform the following steps:

1. Connect the 20 - 48 VDC positive wire to the bottom of the fuse holder as shown in Figure 3-2 on page 11.
2. Connect the negative wire to black terminal as shown in Figure 3-2 on page 11.
3. Connect the ground wire to the green/yellow terminal.

3.1.2 Communications

RS-485 is the default setting used for Com 2 as shown in Figure 3-1 on page 10.

RS-422 and RS-485 Wiring — Com 2

DB-9 Connector on I/O Bracket		
Pin	**Pin Name**	**Signal Type**
1	422-RXD-	IN
2	422-RXD+	IN
3	485-422-TXD+	OUT
4	485-422-TXD-	OUT

Table 3-1: 4-Pin Connectors for RS-422 and RS-485 Communication Protocols

Note Com 1, Com 3, and Com 4 are all standard RS-232 Ports. All communications ports are standard DB-9 male connectors. Com 2 also supports RS-232 if properly configured.

Digital I/O Wiring

Four digital I/O modules can be installed in the 8620 DET. Field wiring should be installed directly onto the Digital I/O Rack as shown in Table 3-2 and Table 3-3.

Pin	Pin Name
2	I/O 1+
3	I/O 1-
4	I/O 2+
5	I/O 2-
6	I/O 3+
7	I/O 3-
8	I/O 4+
9	I/O 4-

Table 3-2: Field Terminal

Pin	Wire Color	Terminal
1	Red	Standard Voltage
2	Black	GND
3	Orange	I/O 1
4	Empty	N/A
5	Brown	I/O 2
6	Empty	N/A
7	Blue	I/O 3
8	Empty	N/A
9	Gray	I/O 4

Table 3-3: Control Terminal — to Single Board Computer

Ethernet Wiring

The 8620 DET has two 100-Base-T Ethernet jacks. One is located on the side of the single board computer. The second one is located on the communications terminal as shown in Figure 3-1 on page 10. Standard 8-pin RJ-45 connectors are used for ethernet wiring.

3.2 Communications Wiring

Table 3-4 describes the wiring considerations for each communications protocol.

Communication Protocol	Description
Ethernet	Maximum length of 250 feet of twisted pair CAT5 cable.
RS-232	Maximum length of 50 feet of cable.
RS-485/422	Maximum length of 4000 feet of cable.

Table 3-4: Communications Wiring Information

4 Configuration

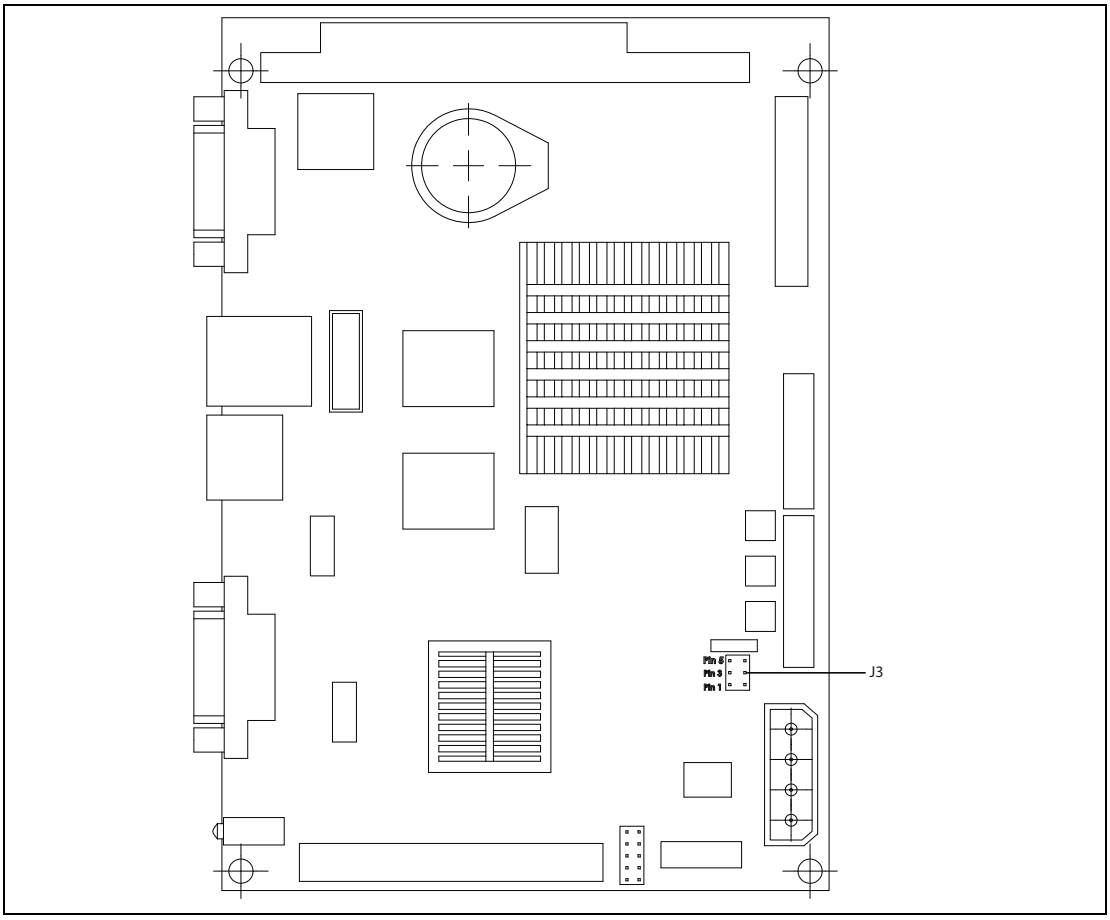

Figure 4-1: J3 on the Single Board Computer

Configuring the 8620 DET consists of the following:

- Configuring the RS-232 Com port (Com 1, 2, 3, and 4)
- Configuring the RS-485/422 or RS-232 Com port (Com 2)
- Configuring the DET.Config File

Note Com 2 is a dual protocol port that can be an RS-232 or an RS-485/422 communications protocol set by jumper J3 on the single board computer (see Figure 4-1 above) as shown in Table 4-1.

Setting	Function
1-2	RS-232
3-4	RS-485 **(Default)**
5-6	RS-422

Table 4-1: Com 2 Setting (J3)

4.1 Configuring the DET.Config File

The DET.Config file is found on the “Local Drive” directory in the Single Board Computer. The values are edited to configure the DET.

Note Be aware that making direct edits to the DET.Config file can result in improper system behavior if not done in accordance with proper XML syntax.

In NotePad, modify the DET.Config file by replacing the necessary variables as shown in the following example (see Table 4-2 below for more information about the variables used in the config file):

Example:

```
<configuration Title=”VarecDET” HostInterfaceType=”Network”
TouchScreen=”False” Watchdog=”False”>

 <HostSerialInterface Name=”COM2:” BaudRate=”9600” Parity=”none” DataBits=”8”
StopBits=”one” Address=”1” />

  <HostNetworkInterface Port=”4096” />
```

Variables	Description	Values	Value Notes
HostInterfaceType	Sets the Host Interface to either Serial or Network	Network Serial	 Default
TouchScreen	Configures DET Software for Touchscreen Interface (Currently Touchscreen Not Supported)	TRUE FALSE	 Default
Watchdog	Enables Watchdog Feature (Currently Not Supported DO NOT Enable)	TRUE FALSE	 Default
HostInterface Name	If HostInterfaceType is set to Serial, this parameter sets the ComPort.	Com 1 Com 2 Com 3 Com 4	RS232 RS485/RS232 RS232 RS232
BaudRate	Sets the Serial Baud Rate	4800 9600 19200	 Default
Parity	Sets the Serial Parity	None Even Odd	Default
DataBits	Sets the Serial Data Bits	8	Default
StopBits	Sets the Serial Stop Bits	one	Default
Address	Sets the Serial Address. If using more than one DET on an RS-485 loop, then each must have a unique address.	1	
HostNetworkInterface Port	If HostinterfaceType is set to Network, this parameter sets the Network Port.	4096	
CardReaderSerial InterfaceEnabled	This parameter enables or disables the Card Reader.	TRUE FALSE	
Name	If CardReadSerialInterface is Enabled, this parameter sets the ComPort.	Com 1 Com 3 Com 4	
BaudRate	Sets the Card Reader Baud Rate	4800 9600 19200	 Default
Parity	Sets the Card Reader Parity	None Odd Even	Default
DataBits	Sets the Card Reader Data Bits	8	Default
StopBits	Sets the Card Reader Stop Bits	1	Default

Table 4-2: Variables Used in the DET.Config File

5 Maintenance and Troubleshooting

5.1 Maintenance

Maintenance should be performed only by authorized personnel.

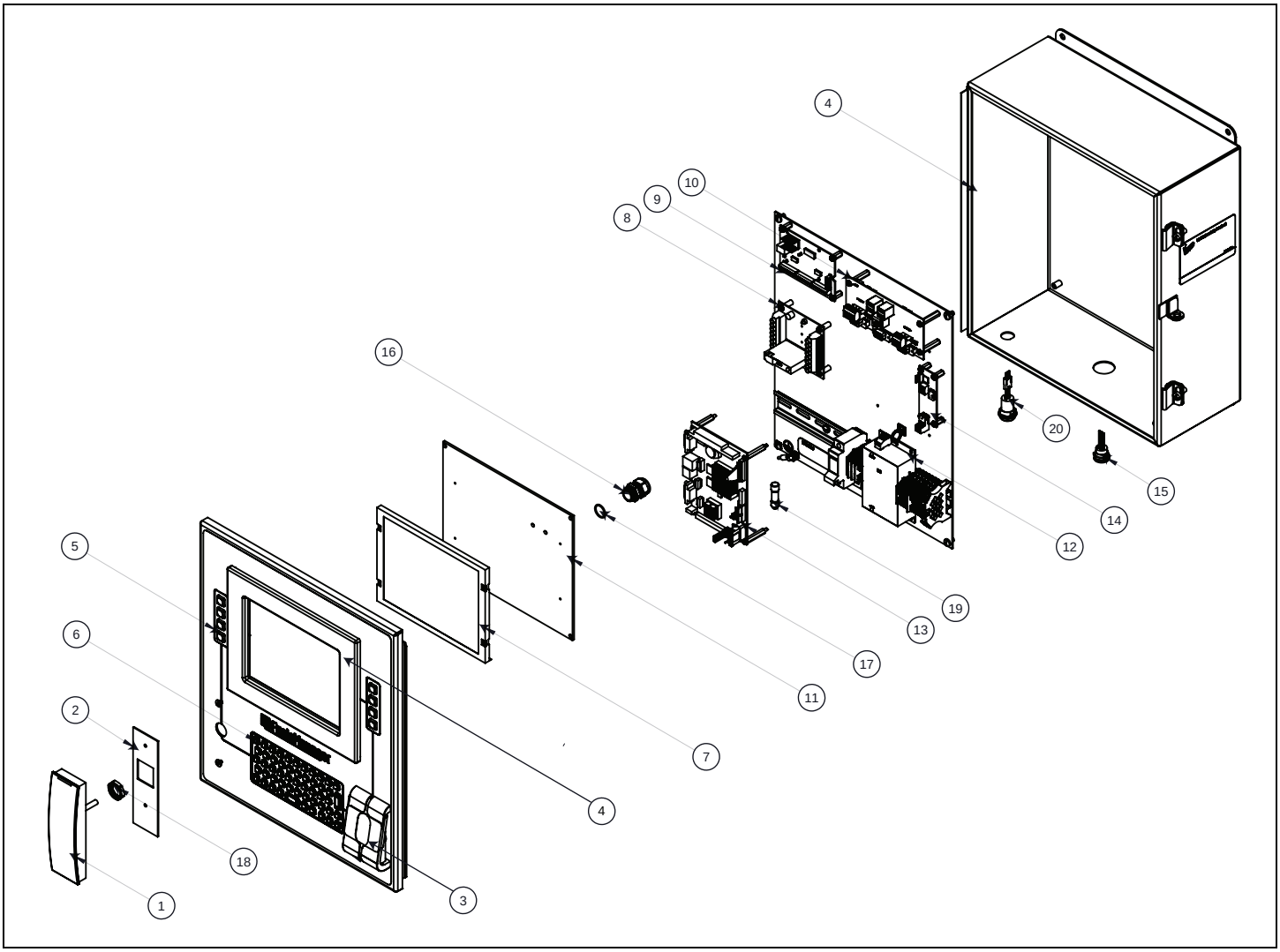

Figure 5-1: 8620 DET Assembly Diagram

Item	Part No.	Quantity	Description
1	8620SCR	1	Smart Carder Reader
2	P14-08620	1	Card Reader Gasket
3	8620FPR	1	Biometric Fingerprint Scanner w/Gasket
4	14001586	1	DET Enclosure including Window Kit
5	200008624	2	4-Key Keypads w/Gasket
6	200008620	1	Alphanumeric Keyboard
7	280061862	1	8.4" TFT (640 x 480, 64,000 Colors) VGA LCD Display
8	08-08622	1	I/O Rack w/Cable
9	08-08632	1	RS-232/Weigand Converter
10	08-01381	1	I/O Surge Board
11	08-012944	1	8620 Interface Board
12	40061635	1	DC Power Supply
	40061637	1	AC Power Supply
13	08-08625	1	32-Bit Single Board Computer
14	08-08625	1	Voltage Monitor PCB Assembly
15	08-08625	1	Push Button Switch (Reset Button)
16	P102-22-025	1	Wire Grommet
17	P102-22-027	1	Wire Grommet O-Ring
18	P102-22-026	1	Wire Grommet Lock Nut
19	P116-01-044	1	Fuse - Class I, Division 2
20	05-013113	1	LED Green/Red Indicator Light Assembly

Table 5-1: 8620 DET Spare Parts List

5.2 Troubleshooting

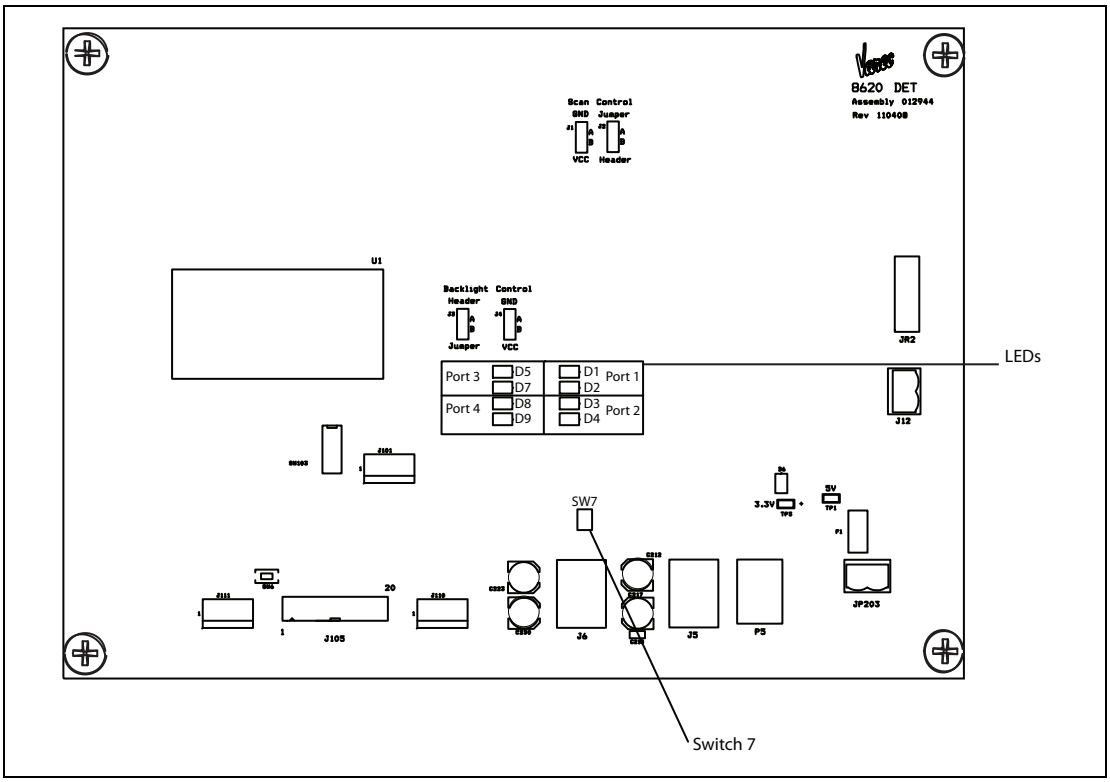

Figure 5-2: LEDs and Switch 7 on the Varec Interface Board

5.2.1 Using Local Diagnostics (LED Indicators)

Refer to Figures 5-2 to locate the 8620 DET Switch 7 (SW7) and LED indicators.

1. If SW7 is up, Port 4 is available as a USB port.
2. If SW7 is down, Port 4 is used for the keyboard.
3. LED D6 is the power indicator switch.
4. Monitor the LED indications as described below:

LED	Purpose	Description
D1 D2	Port 1	Green: Good USB Status Amber: USB Malfunction
D3 D4	Port 2	Green:Good USB Status Amber: USB Malfunction
D5 D7	Port 3	Green: Good USB Status Amber: USB Malfunction
D8 D9 ------ D8 D9	Port 4 = USB Port (SW7 is up) ---------- Port 4 = Keyboard (SW7 is down)	Green: Good USB Status Amber: USB Malfunction ---------- Green: Good Keyboard Status Amber: Keyboard Malfunction

Table 5-2: 8620 LEDs and Switches for Troubleshooting

5.2.2 Replacing the main circuit fuse

! Warning Explosion Hazard. To prevent an electrical shock or ignition of a flammable atmosphere, do not remove or replace the main circuit board fuse while the circuit is live.

1. Turn off the main circuit breaker switch to remove power from the unit.
2. Open the front panel of the 8620 DET.
3. Open the fuse holder to release the fuse.
4. Remove the fuse on the main circuit board from the fuse holder. To locate the fuse holder, refer to Figures 3-1 and 3-2 on pages10 and 11.
5. Replace it with a new fuse (part # P116-01-044).
6. Close the front panel of the 8620 DET.
7. Turn on the main circuit breaker to connect power to the unit.

Table 5-3 lists the type of fuse and the fuse value.

5.2.3 Replacing the I/O Module fuse on the OPTO 22 board

! Warning Explosion Hazard. To prevent an electrical shock or ignition of a flammable atmosphere, do not remove or replace the I/O Module fuse on the OPTO 22 board while the circuit is live.

If the digital I/O has a module with a fuse, do the following to replace the fuse:

1. Turn off the main circuit breaker switch to remove power from the unit.
2. Open the front panel of the 8620 DET.
3. Open the fuse holder to release the fuse.
4. Remove the fuse on the I/O Module from the fuse holder. To locate the fuse holder on the I/O Module, refer to Figures 3-1 and 3-2 on pages10 and 11.
5. Replace it with a new fuse (part # 37411000410).
6. Close the front panel of the 8620 DET.
7. Turn on the main circuit breaker to connect power to the unit.

Table 5-3 lists the type of fuse and the fuse value.

Fuse	Fuse Value	Part #	Description
Main Fuse	1 Amp 600 VAC, 300 VDC	P116-01-044	Cooper Busman Fuse
I/O Module Fuse	1 Amp 250V	37411000410	Wickman 374 Series TRS5® Subminiature Fuse

Table 5-3: Fuse, Fuse Value, Part #, and Description

5.2.4 Replacing the Battery

! Warning There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions

Table 5-4 lists the battery, type, and part number for the CPU board battery.

Battery	Type	Part Number
CPU Board Battery	Lithium 3V / 196 mAH	BR1632

Table 5-4: CPU Board Battery Fuse, Type, and Part Number

5.2.5 8620 DET Voltage Monitor

The voltage monitor monitors the input voltage and detects whether the voltage is low or below an acceptable level (for DC units only). The voltage monitor LED indicates the different states of the input voltage (see Table 5-5 below).

For AC units, the LED indicates that power is supplied to the unit.

Figures 5-3 shows the location of the 8620 DET voltage monitor LED.

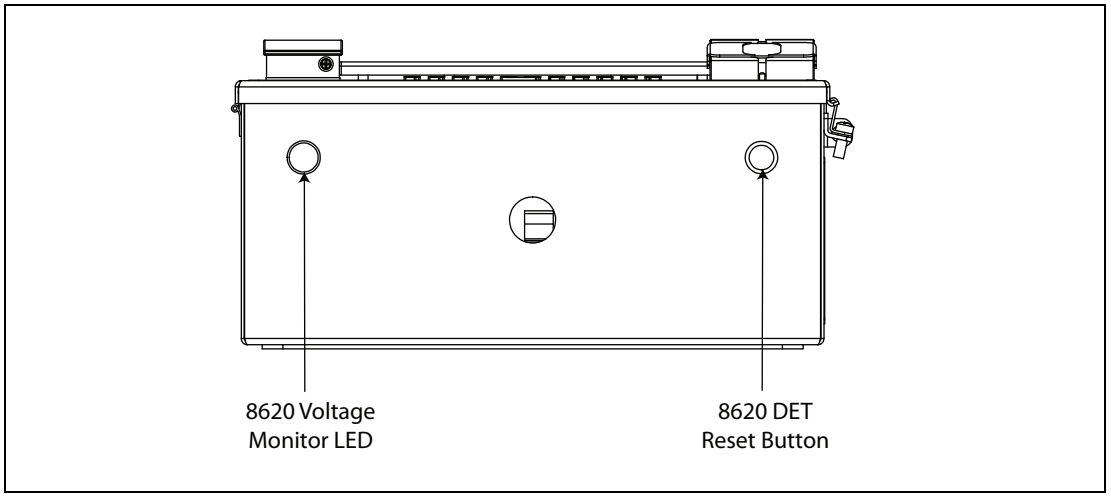

Figure 5-3: 8620 DET Voltage Monitor LED and Reset Button Locations

Table 5-5 lists the input voltage and the state of the LED for monitoring the voltage.

Input Voltage	LED
Above 23 VDC	Solid Green
Approximately 23 VDC – 19 VDC	Flashes Green
Below 19 VDC	Red (The LED remains Red even if good power is restored). Contact Varec for more information.

Table 5-5: Input Voltage and LED State

Note The LED remains Red once the supplied power to the 8620 DET becomes unacceptable. Contact your Varec representative for more information when the LED is RED.

5.2.6 Resetting the 8620 DET

Note The reset button resets the CPU of 8620 DET, but does not reset the voltage monitor.

To reset the 8620 DET, toggle the reset button shown in Figures 5-3 above.

6 Specifications

6.1 General

Manufacturer	Varec, Inc. Atlanta, GA USA
Designation	8620 Driver Entry Terminal (DET)
Function	Field interface device used to control access to different control points

6.2 System Components

Single Board Computer	• Expansion Interface: PC/104 • Battery backup: Lithium 3V/196 mAH • Four serial ports for host communications • Four USB 2.0 compliant universal serial bus ports for internal devices, configuration or optional components. One USB port is always reserved to facilitate communications between the Varec Interface Board and the Single Board Computer. • Solid State Disk (SSD): Supports one 50-pin socket for CFC type (type II optional) • Supports up to four GPIO - uses standard I/O modules • 9 LEDs indicate power and status
Interface	Four USB 2.0 compliant universal serial bus ports for optional interface components. e.g Use of the keyboard requires reservation of a USB port.
Display	24-bit TFT LCD
Keyboard	• Vandal resistant (20J BS EN 60068-2-75: 1997) • Weather resistant (IP65) • 53-Key alphanumeric • Engraved metal keys • RFI/EMI Protection in accordance with European and U.S. directives • Resistant to most commonly used cleaning agents
Voltage Monitor	Indicates the status of the DC supply voltage on DC-powered units and the presence of AC power on AC-powered units.

Smart Card Reader	• Dual reader technology:
	  ◦ iCLASS
	  ◦ Proximity
	• 64-bit authentication keys
	• Programmable LED/Beeper operation
	• Read Range is dependant upon which card is used:
	  ◦ Min. 1.0" (2.5 cm) To Max. 4.0" (10.0 cm)
	• Card Compatibility:
	  125 kHz Proximity:
	  ◦ HID or Indala proximity cards, keyfobs, and tags
	  ◦ AWID Credentials
	  13.56 MHZ contactless smart cards:
	  ◦ ISO 15693 — read only; 2k bit (256 byte), 16k bit (2k byte), and 32k bit (4k byte); serial number
	  ◦ ISO 14443A — read only; MIFARE and DESFire® (serial number)
	  ◦ ISO 14443B — read only; 2k bit (256 byte), and 16k bit (2k byte)
	  ◦ US Government PIV
	  ◦ FeliCa IDm
	• Certifications:
	  ◦ FCC Certification
	  ◦ CE Mark
	• Housing Material: UL94 Polycarbonate

Fingerprint Scanner	• Supports TWIC applications • Waterproof • 12.8 mm X 12.0 mm active sensing area • Aluminum construction with commercial grade power coat finishing • Performs solid 1:1 verification and 1:N identification

6.3 Host Communication

Serial Ports	4
Communications type	Com 1, Com 3, and Com 4: RS-232 Com 2: RS-485/422 or RS-232
Ethernet	2

6.4 Environmental

Operating Temperature	From -40 °C To 70 °C Ambient (From -40 °F To 158 °F Ambient)
Storage Temperature	From -40 °C To 70 °C (From -40 °F To 158 °F)
Humidity	5 - 95% non-Condensing at 0 °C To 55 °C (32 °F To 131 °F)

6.5 Electrical

Operating Voltage	AC or DC • 24 – 48 VDC • 100 – 240 VAC line to neutral 50/60 Hz
Power Consumption DC	• 1A @ 24 VDC
Power Consumption AC	• 175mA @ 110 VAC

6.6 Mechanical Construction

Enclosure Type	Rated NEMA 3R
Material	1/16" Thick Stainless Steel (1.5875 mm)
Dimensions	17.50" x 14.28" x 6.44" (445 x 363 x 164 mm)

6.7 Certifications and Approvals

FM Approvals (cFMus)	Class I, Division 2, Groups C and D, T4 Class I, Zone 2, T4

7 Ordering Information

7.1 Order Codes

	Approvals		Power Supply – Input		Enclosure Heater		Digital I/O		Card Reader		Fingerprint Scanner		
	FM	Factory Mutual Approvals (cFMus) Class I, Division 2, Groups C and D, T4 Class I, Zone 2, T4											
			1	DC									
			2	AC									
					A	None							
							0	None					
							1	Single Dry Contact Output					
							2	Single DC Output					
							9	Custom Configuration					
									A	None			
									B	FIPS Compliant Smart Card Reader			
											0	None	
											1	FIPS Compliant USB Fingerprint Scanner	
N8620–													**Complete Product Designation**

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